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Israel-Stewart-like equations for non-relativistic viscous fluids ARIEL LERMAN, University of Illinois at Urbana-Champaign, JORGE NORONHA, Illinois Center for Advanced Studies of the Universe; Department of Physics, University of Illinois at Urbana-Champaign — The equations of motion of non-relativistic viscous fluids are generalized to include nonlinear relaxation-type equations that describe how viscous fluxes relax towards their standard Navier-Stokes expressions. The new equations of motion provide a non-relativistic version of the famous relativistic Israel-Stewart equations commonly applied to the description of the quark-gluon plasma formed in heavy-ion collisions. We investigate the mathematical properties of these non-relativistic equations, proving that they are hyperbolic (in the full nonlinear regime) and stable against small disturbances around equilibrium. We numerically solve in 1+1 dimensions the case where only bulk viscosity is taken into account and compare the solutions to the corresponding ones obtained from the relativistic Israel-Stewart equations.

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